

## **Managing red deer populations according to the IUCN requirements in the National Park Hohe Tauern, Austria**

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### **Summary**

The Austrian national park "Hohe Tauern" initialized a telemetry study from 1999 to 2006 to develop management plans to control and regulate the population density of red deer according to the IUCN guidelines. Therefore a maximum of 25% of the national park should be used for regulation by culling. An elaborate management concept led to a stable and sustainable red deer stock. Considering the spatial and seasonal migration patterns the culling activities were most effective within the recommended regulation areas. This led to less shy deer in their optimal habitat above the timberline during summer months and a good visibility to visitors. In addition the impact on forest vegetation (browsing, bark stripping) could be reduced.

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### **Keywords**

Red deer, management, national park

### **Aims and duration**

Establishing a red deer management according to the requirements of a national park is essential to attain the status of international acceptance by the IUCN. With the results of a telemetry study from 1999 to 2006 a management plan was developed to control and regulate the population density of red deer in a model area. To keep the human impact on the core area as low as possible the surrounding areas of the national park should be included in the management actions. Additionally the impact of the deer on the forest vegetation should be kept at a tolerable level.

### **Area of study**

The study area was located in the "Koetschach valley" in the eastern region of the National Park Hohe Tauern near the village of Bad Gastein (province Salzburg, Austria). The valley is running from southeast to northwest at an elevation from 1,280m to 1,080m above sea level, and is surrounded by mountains up to 3,000 m. The valley was part of the hunting territory "Koetschach" that includes a part of the national park. From the total hunting area of 3.878 ha, 2.557 ha (66%) were national park core area, 738 ha (19%) buffer area and the rest of 583 ha (15%) were regular hunting ground outside the national park.

A supplementary winter feeding station for red deer is situated near the border to the core area of the national park.

### **Methods**

Red deer counts were established in the model area of the national park and in the surrounding areas relevant for red deer management. The census was done annually on the same spot at about the same time. Three mid-summer census areas were in high altitudes and one winter area was at a supplementary feeding station in the valley. The consequences of different management measures were consistently monitored using different field methods including GPS collars to get a better insight in the spatial migration and the seasonal activity of red deer. The results serve the adaptive management.

### **Results and discussion**

The results showed a strong deer dislocation from winter to summer ranges and vice versa. At the end of April, when the feeding station was closed down, the deer started to migrate to the high altitude areas above the treeline. These alpine meadows provided the optimal summer habitat for these large herbivores, far away from woodland with a high susceptibility to wildlife damage like

browsing or bark stripping. They stayed the summer in these areas and started to disperse in lower altitudes again in September. In October they showed the first tendencies to get back to the supplementary feeding station and a group of 40 to 50 individuals was fed as from November. The total sum of supplementary fed individuals of 120 was fed from January to March.

We combined these space and time dependent migration patterns with the zonal classification and the respective IUCN guidelines and developed an elaborate management concept for our research area including the surrounding hunting areas.

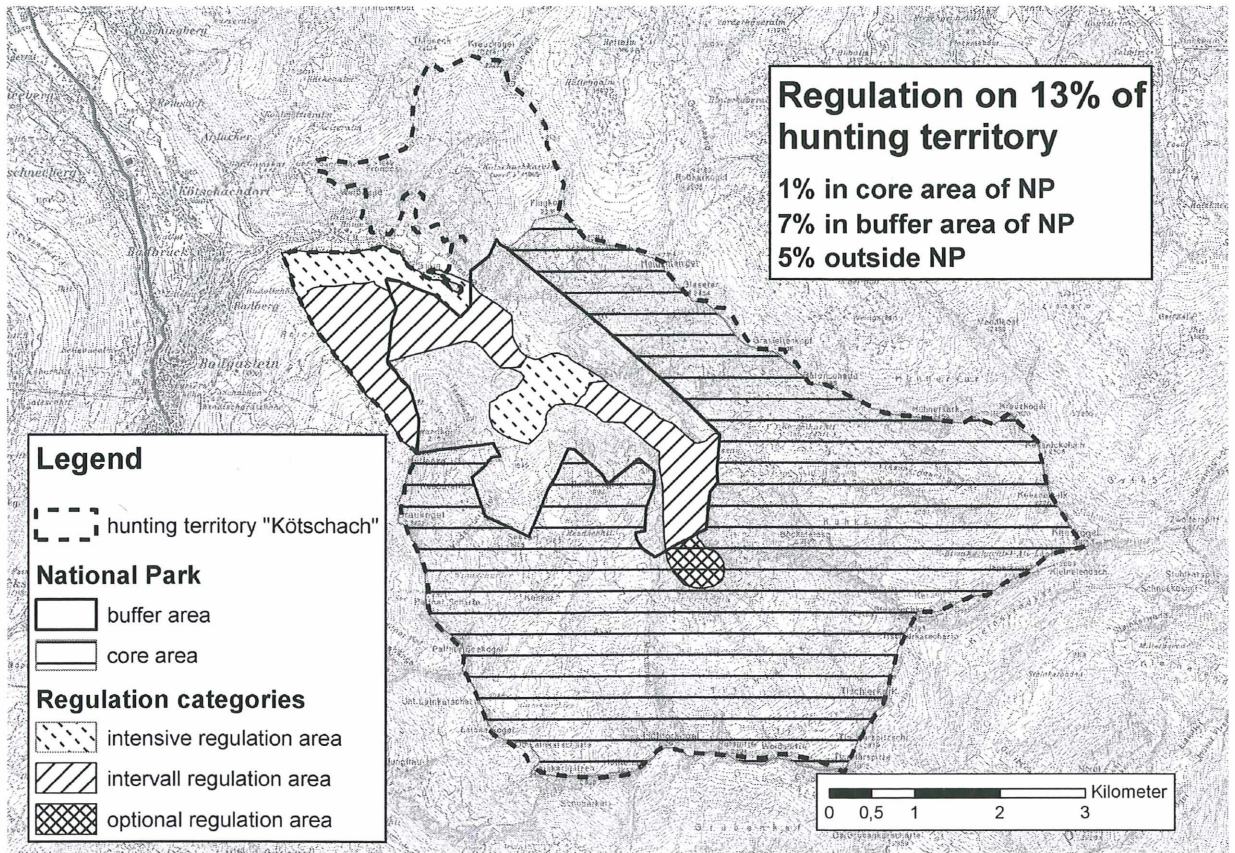


Figure 1: Regulation categories within the hunting territory "Kötschach"

Due to the spatial distribution throughout the year the deer stayed only a very short time on potential hunting ground. This was, on the one hand, in May, when they left the feeding and went in the high altitudes. On the other hand, it was on their way back from the summer ranges to the feeding site in Autumn. Thus, the legitimate shooting quota of the hunting area could only be done in May and from October to November, the effective regulation time frame is shortened to 10 weeks instead of 6 to 5 months (depending on sex and age). To optimize this shortened time frame, following management implications were taken:

No culling activities (resting areas) in the central and most important summer habitats (high altitude areas) as well as winter habitats (near the feeding station).

Establishing of space-time dependent regulation categories: Intensive regulation areas (strong and permanent hunting pressure in that area) and interval regulation areas (alternating hunting activities and recovery phases)

Culling of yearlings mainly in May (within the forested areas before red deer migrate to high summer habitats)

The professional realization of these implications led to a stable and sustainable red deer stock within several years. All regulation activities took place on only 13% of the hunting area, most of the culling was done in the buffer area or outside the park. This strengthened the importance of including the surrounding areas of a national park in an applicable and sustainable management concept. With displaying and executing space-time dependent regulation categories and the main focus on hunting the yearlings in May the reduction to a tolerable (in terms of the deer impact on the vegetation) red deer stock could be achieved in a most efficient and sustainable way. The short periods of hunting and the associated short period of disturbance by the hunter minimized the risk of damage caused by red deer. Furthermore the deer became less shy in their optimal habitat

above the timberline during summer months with herds up to 200 individuals, the visibility to visitors was improved.

Contrary requirements to all appearances could be combined in this project: the reduction of a red deer stock to a tolerable minimum on the fraction of the possible area in a small period of time. The professional realization outside the core area led to a manageable red deer stock with positive effects for the whole area (less impact on forest vegetation, better visibility). This concept played an important role for the international acceptance of Austria's oldest national park.

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